

## United States Department of Agriculture Natural Resources Conservation Service

### Ecological Site Description

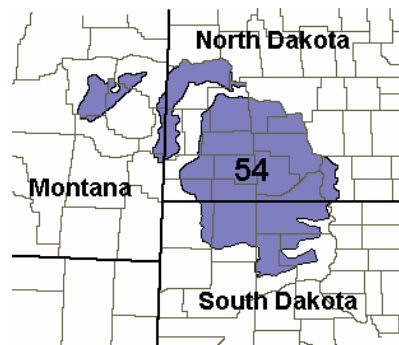
**Site Name:** Loamy Overflow

**Site Type:** Rangeland

**Site ID:** R054XY023ND

**Major Land Resource Area:** 54 – Rolling Soft Shale Plain

For more information on MLRA's refer to the following web site:  
[http://www.essc.psu.edu/soil\\_info/soil\\_1rr/](http://www.essc.psu.edu/soil_info/soil_1rr/)



### Physiographic Features

This site occurs on frequently flooded intermittent stream and flood plains of stream.

**Landform:** swale, flood plain

**Aspect:** NA

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1600	3600
<b>Slope (percent):</b>	1	9
<b>Water Table Depth (inches):</b>	48	>72
<b>Flooding:</b>		
<b>Frequency:</b>	Frequent	Very frequent
<b>Duration:</b>	Extremely brief	Brief
<b>Ponding:</b>		
<b>Depth (inches):</b>	None	None
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	negligible	medium

### Climatic Features

MLRA 54 is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are characteristic. The climate is the result of this MLRA's location in the geographic center of North America. There are few natural barriers on the northern Great Plains. The air masses move unobstructed across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 14 to 18 inches per year. The normal average annual temperature is about 42° F. January is the coldest month with average temperatures ranging from about 13° F (Beach, ND) to about 16° F (Bison, SD). July is the warmest month with temperatures averaging from about 69° F (Beach, ND) to about 72° F (Timber Lake, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 57° F. This large annual range attests to the continental nature of this MLRA's climate. Hourly winds are estimated to average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of native cool-season plants begins in late March and continues to early to mid July. Native warm-season plants begin growth in mid May and continue to the end of August. Green up of cool-season plants can occur in September and October when adequate soil moisture is present.

	<u>Minimum</u>	<u>Maximum</u>
<b>Frost-free period (days):</b>	119	136
<b>Freeze-free period (days):</b>	139	157
<b>Mean Annual Precipitation (inches):</b>	14	18

#### Average Monthly Precipitation (inches) and Temperature (°F):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.41	0.54	2.2	23.8
February	0.37	0.61	8.7	30.4
March	0.51	1.07	17.1	40.0
April	1.13	1.88	28.9	56.8
May	1.98	2.83	40.5	69.3
June	2.83	3.29	49.8	78.3
July	2.05	2.25	54.6	85.2
August	1.49	2.07	53.0	84.3
September	1.29	1.45	42.0	73.4
October	0.89	1.35	31.6	60.4
November	0.48	0.61	19.0	41.5
December	0.42	0.55	8.1	29.0

Climate Stations		Period	
Station ID	Location or Name	From	To
ND0590	Beach	1949	1999
MT7560	Sidney	1949	1999
SD8307	Timber Lake	1948	1999
ND2183	Dickinson FAA AP	1948	1999

For local climate stations that may be more representative, refer to <http://www.wcc.nrcs.usda.gov>.

## Influencing Water Features

**Stream Type:** C6  
(Rosgen System)

## Representative Soil Features

The common features of soils in this site are the silt loam to fine sandy loam textured subsoil and slopes of 1 to 9 percent. The soils in this site are moderately well to well drained and formed in alluvium. The silt loam to fine sandy loam surface layer is 5 to 20 inches thick. The soils have a moderately slow to moderately rapid infiltration rate. This site should show slight to no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases where vegetative cover is not adequate. Loss of the soil surface layer can result in a shift in species composition and/or production.

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service Field Office Technical Guide or the following web sites:

North Dakota <http://www.nd.nrcs.usda.gov/>

South Dakota <http://www.sd.nrcs.usda.gov/>

Montana <http://www.mt.nrcs.usda.gov/>

**Parent Material Kind:** alluvium

**Parent Material Origin:** sedimentary, unspecified

**Surface Texture:** silt loam, loam, fine sandy loam

**Surface Texture Modifier:** none

**Subsurface Texture Group:** loamy

**Surface Fragments  $\leq 3''$  (% Cover):** 0

**Surface Fragments  $> 3''$  (%Cover):** 0

**Subsurface Fragments  $\leq 3''$  (% Volume):** 0-10

**Subsurface Fragments  $> 3''$  (% Volume):** 0-5

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	moderately well	moderately well
<b>Permeability Class:</b>	moderately slow	rapid
<b>Depth to first restrictive layer (inches):</b>	$>72$	$>72$
<b>Electrical Conductivity (mmhos/cm)*:</b>	0	4
<b>Sodium Absorption Ratio*:</b>	0	5
<b>Soil Reaction (1:1 Water)*:</b>	6.1	8.4
<b>Soil Reaction (0.1M CaCl<sub>2</sub>)*:</b>	NA	NA
<b>Available Water Capacity (inches)*:</b>	4	7
<b>Calcium Carbonate Equivalent (percent)*:</b>	0	15

\* - These attributes represent from 0-40 inches or to the first restrictive layer.

## Plant Communities

### Ecological Dynamics of the Site:

The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Due to the nature of the soils, the site is considered very stable. Under continued adverse impacts, a slow decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can quickly return to the Historic Climax Plant Community (HCPC).

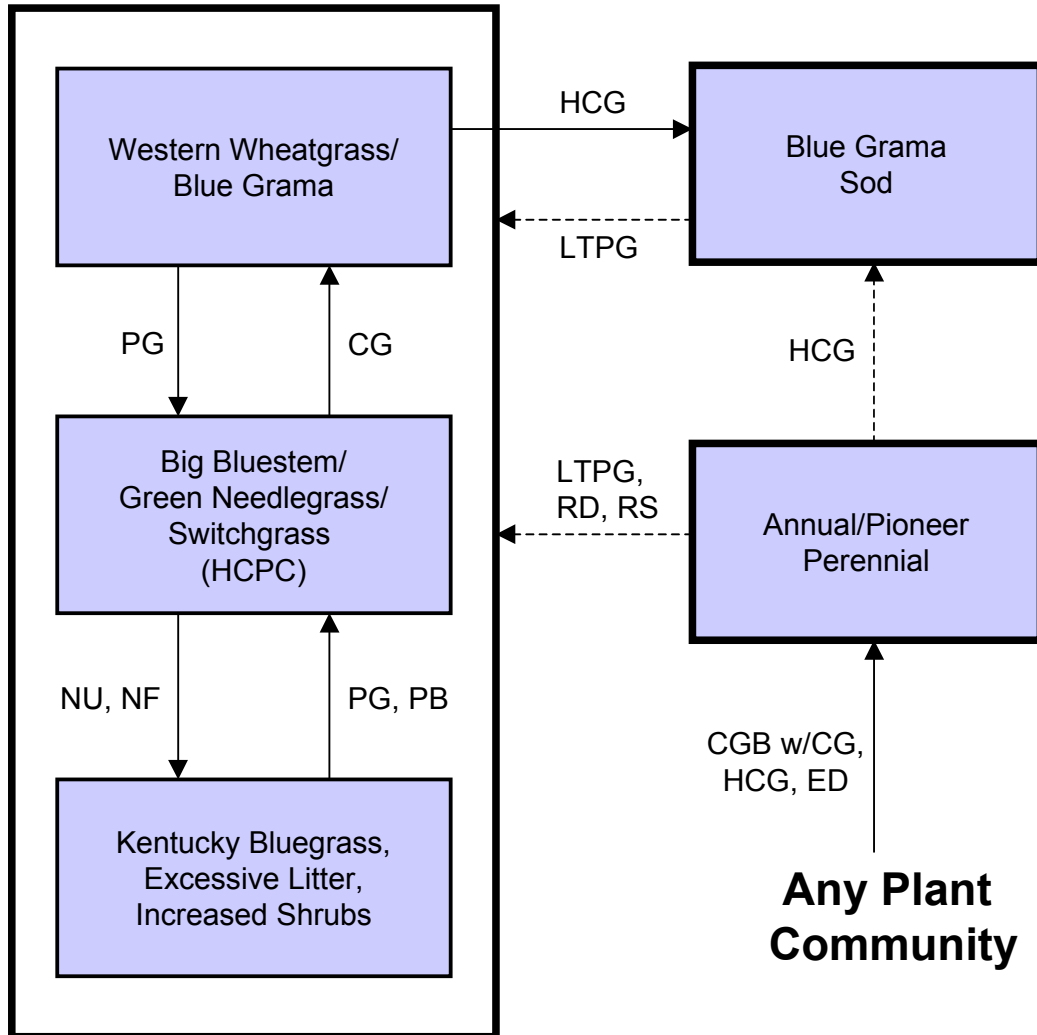
The plant community upon which interpretations are primarily based is the Historic Climax Plant Community. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been considered. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

Continuous grazing without adequate recovery periods following each grazing occurrence over several years causes this site to depart from the HCPC. Species such as western wheatgrass and blue grama will initially increase. Big bluestem, green needlegrass, and sideoats grama will decrease in frequency and production. In time, heavy continuous grazing will likely cause blue grama to dominate the site and then this plant community is relatively stable and the competitive advantage prevents other species from establishing. This plant community is less productive than the HCPC. Runoff increases and infiltration will decrease. Soil erosion will be minimal.

Extended periods of non-use and/or lack of fire will result in a plant community having high litter levels, which favors an increase in Kentucky bluegrass and/or smooth brome grass. In time, shrubs such as western snowberry and chokecherry will likely increase and then dominate the site.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

## Plant Communities and Transitional Pathways



**CG** - continuous grazing without adequate recovery opportunity; **CGB w/CG** - cropped go-back with continuous grazing; **ED** - excessive defoliation; **HCG** - heavy continuous grazing; **HCPC** - Historic Climax Plant Community; **LTPG** - long-term prescribed grazing (>20 years); **NU, NF** - non-use, no fire; **PB** - prescribed burning followed by prescribed grazing; **PG** - prescribed grazing with adequate recovery opportunity; **RS** - range seeding followed by prescribed grazing; **RD** - removal of disturbance.

## Plant Community Composition and Group Annual Production

		Big Bluestem/Green Needlegrass/Switchgrass			
COMMON/GROUP NAME	SYMBOL	Group	lbs./acre	% Comp	
GRASSES & GRASS-LIKES			2720 - 3040	85 - 95	
TALL WARM-SEASON		1	800 - 1120	25 - 35	
big bluestem	ANGE	1	640 - 960	20 - 30	
switchgrass	PAVI2	1	160 - 320	5 - 10	
Indiangrass	SONU2	1	32 - 64	1 - 2	
WHEATGRASS		2	320 - 480	10 - 15	
western wheatgrass	PASM	2	320 - 480	10 - 15	
slender wheatgrass	ELTRT	2	32 - 64	1 - 2	
bearded wheatgrass	ELTRS	2	32 - 64	1 - 2	
NEEDLEGRASS		3	480 - 640	15 - 20	
green needlegrass	NAVI4	3	320 - 640	10 - 20	
porcupine grass	HESP11	3	64 - 160	2 - 5	
MID WARM-SEASON		4	96 - 160	3 - 5	
sideoats grama	BOCU	4	96 - 160	3 - 5	
little bluestem	SCSC	4	0 - 64	0 - 2	
OTHER NATIVE GRASSES		5	64 - 96	2 - 3	
blue grama	BOGR2	5	32 - 64	1 - 2	
Canada wildrye	ELCA4	5	32 - 64	1 - 2	
prairie dropseed	SPHE	5	32 - 64	1 - 2	
needleandthread	HECOC8	5	32 - 64	1 - 2	
other perennial grasses	2GP	5	32 - 64	1 - 2	
GRASS-LIKES		6	96 - 160	3 - 5	
Penn sedge	CAPE6	6	64 - 160	2 - 5	
fescue sedge	CABR10	6	32 - 64	1 - 2	
other grass-likes	2GL	6	32 - 96	1 - 3	
FORBS		7	160 - 320	5 - 10	
American licorice	GLLE3	7	32 - 64	1 - 2	
American vetch	VIAM	7	32 - 64	1 - 2	
cudweed sagewort	ARLU	7	32 - 32	1 - 1	
Flodman's thistle	CIFL	7	0 - 32	0 - 1	
goldenrod	SOLID	7	32 - 64	1 - 2	
heartleaf alexanders	ZIAP	7	0 - 32	0 - 1	
heath aster	SYER	7	32 - 64	1 - 2	
Maximilian sunflower	HEMA2	7	32 - 64	1 - 2	
meadow anemone	ANCA8	7	32 - 32	1 - 1	
northern bedstraw	GABO2	7	0 - 32	0 - 1	
prairie coneflower	RACO3	7	0 - 32	0 - 1	
purple prairie clover	DAPU5	7	32 - 64	1 - 2	
silverleaf scurfpea	PEAR6	7	0 - 32	0 - 1	
western yarrow	ACMI2	7	32 - 64	1 - 2	
other perennial forbs	2FP	7	0 - 64	0 - 2	
SHRUBS		8	96 - 160	3 - 5	
chokecherry	PRVI	8	32 - 64	1 - 2	
golden currant	RIAU	8	32 - 64	1 - 2	
hawthorn	CRATA	8	32 - 64	1 - 2	
juneberry	AMAL2	8	32 - 64	1 - 2	
leadplant	AMCA6	8	0 - 64	0 - 2	
poison ivy	TORY	8	0 - 32	0 - 1	
prairie rose	ROAR3	8	32 - 64	1 - 2	
western snowberry	SYOC	8	64 - 96	2 - 3	
wild plum	PRAM	8	32 - 64	1 - 2	
other shrubs	2SHRUB	8	0 - 32	0 - 1	
TREES		9	32 - 64	1 - 2	
American elm	ULAM	9	0 - 32	0 - 1	
green ash	FRPE	9	32 - 64	1 - 2	
other trees	2TREE	9	0 - 32	0 - 1	
Annual Production lbs./acre			LOW	RV	HIGH
GRASSES & GRASS-LIKES			2120 -	2784	- 3420
FORBS			155 -	240	- 350
SHRUBS			95 -	128	- 165
TREES			30 -	48	- 65
TOTAL			2400 -	3200	- 4000

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative Value.

## Plant Community Composition and Group Annual Production

		Big Bluestem/Green Needlegrass/Switchgrass			Western Wheatgrass/ Blue Grama			Blue Grama Sod			Kentucky Bluegrass, Excessive Litter, Increased Shrubs		
COMMON/GROUP NAME	SYMBOL	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			2720 - 3040	85 - 95		1870 - 2090	85 - 95		960 - 1080	80 - 90		1890 - 2160	70 - 80
TALL WARM-SEASON		1	800 - 1120	25 - 35	1	66 - 110	3 - 5	1	12 - 24	1 - 2		54 - 135	2 - 5
big bluestem	ANGE	1	640 - 960	20 - 30	1	44 - 110	2 - 5	1	12 - 24	1 - 2		54 - 135	2 - 5
switchgrass	PAV12	1	160 - 320	5 - 10	1	0 - 22	0 - 1					0 - 27	0 - 1
Indiangrass	SONU2	1	0 - 64	0 - 2									
WHEATGRASS		2	320 - 480	10 - 15	2	440 - 550	20 - 25	2	180 - 240	15 - 20		54 - 135	2 - 5
western wheatgrass	PASM	2	320 - 480	10 - 15	2	440 - 550	20 - 25	2	180 - 240	15 - 20		54 - 135	2 - 5
slender wheatgrass	ELTRT	2	32 - 64	1 - 2	2	0 - 22	0 - 1	2	0 - 12	0 - 1		0 - 27	0 - 1
bearded wheatgrass	ELTRS	2	32 - 64	1 - 2	2	0 - 22	0 - 1					27 - 54	1 - 2
NEEDLEGRASS		3	480 - 640	15 - 20	3	44 - 66	2 - 3	3	0 - 24	0 - 2		27 - 108	1 - 4
green needlegrass	NAV14	3	320 - 640	10 - 20	3	44 - 66	2 - 3	3	0 - 24	0 - 2		27 - 108	1 - 4
porcupine grass	HESP11	3	64 - 160	2 - 5	3	0 - 22	0 - 1					0 - 27	0 - 1
MID WARM-SEASON		4	96 - 160	3 - 5	4	0 - 44	0 - 2	4	0 - 24	0 - 2		0 - 27	0 - 1
sideoats grama	BOCU	4	96 - 160	3 - 5	4	0 - 44	0 - 2	4	0 - 24	0 - 2			
little bluestem	SCSC	4	0 - 64	0 - 2	4	0 - 22	0 - 1					0 - 27	0 - 1
OTHER NATIVE GRASSES		5	64 - 96	2 - 3	5	550 - 770	25 - 35	5	420 - 540	35 - 45		81 - 135	3 - 5
blue grama	BOGR2	5	32 - 64	1 - 2	5	440 - 550	20 - 25	5	420 - 540	35 - 45			
prairie junegrass	KOMA				5	66 - 132	3 - 6	5	24 - 48	2 - 4		27 - 54	1 - 2
red threeawn	ARPUL				5	22 - 44	1 - 2	5	36 - 60	3 - 5		0 - 27	0 - 1
Canada wildrye	ELCA4	5	32 - 64	1 - 2	5	0 - 22	0 - 1					0 - 27	0 - 1
prairie dropseed	SPHE	5	32 - 64	1 - 2									
inland saltgrass	DISP				5	0 - 44	0 - 2	5	12 - 48	1 - 4			
Sandberg bluegrass	POSE				5	44 - 66	2 - 3	5	24 - 48	2 - 4		81 - 135	3 - 5
needleandthread	HECOC8	5	32 - 64	1 - 2	5	110 - 220	5 - 10	5	48 - 72	4 - 6		27 - 54	1 - 2
other perennial grasses	ZGP	5	32 - 64	1 - 2	5	22 - 44	1 - 2	5	0 - 12	0 - 1		0 - 27	0 - 1
GRASS-LIKES		6	96 - 160	3 - 5	6	44 - 66	2 - 3	6	12 - 24	1 - 2		27 - 54	1 - 2
Penn sedge	CAPE6	6	64 - 160	2 - 5	6	22 - 44	1 - 2					27 - 54	1 - 2
fescue sedge	CABR10	6	32 - 64	1 - 2	6	0 - 22	0 - 1	6	0 - 12	0 - 1		27 - 54	1 - 2
other grass-like	2GL	6	32 - 96	1 - 3	6	22 - 44	1 - 2	6	12 - 24	1 - 2		0 - 27	0 - 1
NON-NATIVE GRASSES		7			7	110 - 220	5 - 10	7	84 - 120	7 - 10		945 - 1215	35 - 45
Kentucky bluegrass	POPR				7	110 - 176	5 - 8	7	60 - 120	5 - 10		270 - 1215	10 - 45
bluegrass	POA				7	22 - 44	1 - 2	7	12 - 24	1 - 2		135 - 405	5 - 15
smooth bromegrass	BRIN2				7	0 - 44	0 - 2	7	0 - 60	0 - 5		0 - 945	0 - 35
cheatgrass	BRTE				7	0 - 22	0 - 1	7	0 - 24	0 - 2		81 - 135	3 - 5
FORBS		8	160 - 320	5 - 10	8	220 - 286	10 - 13	8	120 - 180	10 - 15	8	189 - 243	7 - 9
American licorice	GLLE3	8	32 - 64	1 - 2	8	0 - 22	0 - 1				8	0 - 27	0 - 1
American vetch	VIAM	8	32 - 64	1 - 2	8	0 - 22	0 - 1				8	0 - 27	0 - 1
black medic	MELU				8	22 - 44	1 - 2	8	12 - 24	1 - 2	8	27 - 54	1 - 2
Canada thistle	CIAR4				8	0 - 110	0 - 5	8	0 - 60	0 - 5	8	0 - 135	0 - 5
cocklebur	XANTH2				8	0 - 44	0 - 2	8	0 - 120	0 - 10	8	0 - 135	0 - 5
common dandelion	TAOF				8	44 - 66	2 - 3	8	24 - 48	2 - 4	8	27 - 54	1 - 2
cudweed sagewort	ARLU	8	32 - 32	1 - 1	8	44 - 88	2 - 4	8	36 - 60	3 - 5	8	54 - 81	2 - 3
curlycup gumweed	GRSQ				8	0 - 22	0 - 1	8	24 - 36	2 - 3	8	0 - 27	0 - 1
Flodman's thistle	CIFL	8	0 - 32	0 - 1	8	0 - 22	0 - 1	8	24 - 36	2 - 3	8	27 - 54	1 - 2
goldenrod	SOLID	8	32 - 64	1 - 2	8	0 - 22	0 - 1	8	24 - 36	2 - 3	8	27 - 54	1 - 2
green sagewort	ARDR4				8	44 - 66	2 - 3	8	36 - 48	3 - 4	8	27 - 54	1 - 2
heartleaf alexanders	ZIAP	8	0 - 32	0 - 1							8	0 - 27	0 - 1
heath aster	SYER	8	32 - 64	1 - 2	8	44 - 66	2 - 3	8	24 - 36	2 - 3	8	27 - 54	1 - 2
Maximilian sunflower	HEMA2	8	32 - 64	1 - 2							8	27 - 54	1 - 2
meadow anemone	ANCA8	8	32 - 32	1 - 1							8	0 - 27	0 - 1
northern bedstraw	GABO2	8	0 - 32	0 - 1	8	22 - 44	1 - 2				8	0 - 27	0 - 1
poison hemlock	COMA2				8	0 - 22	0 - 1				8	27 - 54	1 - 2
prairie coneflower	RACO3	8	0 - 32	0 - 1	8	44 - 66	2 - 3	8	36 - 48	3 - 4	8	27 - 54	1 - 2
purple prairie clover	DAPU5	8	32 - 64	1 - 2	8	0 - 22	0 - 1				8	0 - 27	0 - 1
pussytoes	ANTEN				8	22 - 44	1 - 2	8	24 - 36	2 - 3	8	0 - 27	0 - 1
scarlet globemallow	SPCO				8	22 - 44	1 - 2	8	24 - 36	2 - 3	8	0 - 27	0 - 1
silverleaf scurpea	PEAR6	8	0 - 32	0 - 1	8	44 - 66	2 - 3	8	24 - 36	2 - 3	8	27 - 54	1 - 2
stinging nettle	URDI										8	54 - 81	2 - 3
sweetclover	MELIL				8	0 - 44	0 - 2	8	12 - 60	1 - 5	8	27 - 189	1 - 7
wavyleaf thistle	CIUN				8	0 - 22	0 - 1	8	24 - 36	2 - 3	8	27 - 54	1 - 2
western ragweed	AMPS				8	22 - 44	1 - 2	8	24 - 36	2 - 3	8	27 - 54	1 - 2
western salsify	TRDU				8	0 - 22	0 - 1	8	12 - 24	1 - 2	8	27 - 27	1 - 1
western yarrow	ACMI2	8	32 - 64	1 - 2	8	44 - 66	2 - 3	8	36 - 48	3 - 4	8	27 - 54	1 - 2
wild parsley	MUDI				8	0 - 22	0 - 1	8	0 - 12	0 - 1			
other perennial forbs	2FP	8	0 - 64	0 - 2	8	0 - 22	0 - 1	8	0 - 12	0 - 1	8	0 - 27	0 - 1
other annual forbs	2FA				8	0 - 22	0 - 1	8	0 - 12	0 - 1	8	0 - 27	0 - 1
SHRUBS		9	96 - 160	3 - 5	9	22 - 66	1 - 3	9	36 - 60	3 - 5	9	405 - 540	15 - 20
chokecherry	PRV1	9	32 - 64	1 - 2	9	0 - 22	0 - 1				9	81 - 135	3 - 5
fringed sagewort	ARFR4				9	44 - 66	2 - 3	9	36 - 60	3 - 5	9	27 - 54	1 - 2
golden currant	RIAU	9	32 - 64	1 - 2							9	27 - 54	1 - 2
hawthorn	CRATA	9	32 - 64	1 - 2	9	0 - 22	0 - 1				9	27 - 81	1 - 3
juneberry	AMAL2	9	32 - 64	1 - 2	9	0 - 22	0 - 1				9	27 - 81	1 - 3
leadplant	AMCA6	9	0 - 64	0 - 2	9	0 - 22	0 - 1				9	0 - 27	0 - 1
poison ivy	TORY	9	0 - 32	0 - 1							9	0 - 27	0 - 1
prairie rose	ROAR3	9	32 - 64	1 - 2	9	0 - 22	0 - 1	9	0 - 12	0 - 1	9	27 - 54	1 - 2
western snowberry	SYOC	9	64 - 96	2 - 3	9	22 - 44	1 - 2	9	0 - 12	0 - 1	9	270 - 405	10 - 15
wild plum	PRAM	9	32 - 64	1 - 2	9	0 - 22	0 - 1				9	27 - 81	1 - 3
other shrubs	2SHRUB	9	0 - 32	0 - 1	9	0 - 22	0 - 1				9	0 - 27	0 - 1
TREES		10	32 - 64	1 - 2	10	0 - 22	0 - 1	10	0 - 12	0 - 1	10	81 - 108	3 - 4
American elm	ULAM	10	0 - 32	0 - 1	10	0 - 22	0 - 1	10	0 - 12	0 - 1	10	0 - 54	0 - 2
green ash	FRPE	10	32 - 64	1 - 2	10	0 - 22	0 - 1	10	0 - 12	0 - 1	10	81 - 108	3 - 4
other trees	2TREE	10	0 - 32	0 - 1	10	0 - 22	0 - 1	10	0 - 12	0 - 1	10	0 - 27	0 - 1
Annual Production lbs./acre													
GRASSES & GRASS-LIKES		LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH	LOW	RV	HIGH
FORBS		2120 - 2784	3420		1265 - 1892	2605		550 - 996	1335		1515 - 1917	2440	
SHRUBS		155 - 240	350		215 - 253	300		115 - 150	185		185 - 216	250	
TREES		95 - 128	165		20 - 44	70		35 - 48	65		220 - 473	600	
TOTAL		30 - 48	65		0 - 11	25		0 - 6	15		80 - 95	110	
TOTAL		2400 - 3200	4000		1500 - 2200	3000		700 - 1200	1600		2000 - 2700	3400	

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

## Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data are collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as “Desired Plant Communities”. According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC’s) will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

### Big Bluestem/Green Needlegrass Plant Community

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This community evolved with grazing by large herbivores and occasional prairie fire. It is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for adequate recovery periods following each grazing event.

The potential vegetation is about 83% grasses and grass-like plants, 10% forbs, 5% shrubs, and 2% trees. Major grasses include big bluestem, green needlegrass, switchgrass and western wheatgrass. Other grasses occurring on this community include blue grama, Canada wildrye, and porcupine grass. Major forbs and shrubs include American vetch, purple prairie clover, and western snowberry. Scattered green ash and American elm may occur.

This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. The diversity in plant species allows for high drought tolerance. Run-off from adjacent sites and moderate or high available water capacity provides a favorable soil-water-plant relationship.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: ND5403

Growth curve name: Missouri Slope, Native Grasslands, Warm-season dominant.

Growth curve description: Warm-season, tall/mid grass dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	4	17	40	30	8	1	0	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery periods between grazing events will shift this plant community to the *Western Wheatgrass/Blue Grama Plant Community*.
- Non-use and no fire will move this plant community to the *Kentucky Bluegrass, Excessive Litter, Increased Shrubs Plant Community*.

### Western Wheatgrass/Blue Grama Plant Community

This plant community results from continuous grazing without adequate recovery periods between each grazing event during the growing season. Recognition of this plant community will enable the land user to implement key management decisions before a significant ecological threshold is crossed.

Blue grama and western wheatgrass are the dominant species. Big bluestem and green needlegrass are greatly reduced. Sideoats grama has been removed. Forb species include western yarrow, asters, prairie coneflower, silverleaf scurfpea and western ragweed. Shrub species would tend to be heavily browsed.

This plant community is relatively stable and less productive than the HCPC. Reduction of litter and reduced plant vigor result in higher soil temperatures, poor water infiltration rates, increased runoff and high evapo-transpiration rates. This plant community can occur throughout the site, on spot grazed areas, and around water sources where season-long grazing patterns occur. Soil erosion will be minimal due to the sod forming habit of blue grama.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: ND5402

Growth curve name: Missouri Slope, Native Grasslands, Cool/Warm-season Mix.

Growth curve description: Cool-season/tall warm-season dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	6	21	40	20	6	4	1	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Heavy continuous grazing without adequate recovery between grazing events will move this plant community across an ecological threshold to the *Blue Grama Sod Plant Community*.
- Prescribed grazing with adequate recovery periods following each grazing event and proper stocking will shift this plant community back to the *Big Bluestem/Green Needlegrass Plant Community (HCPC)*.

### **Kentucky Bluegrass, Excessive Litter, Increased Shrubs Plant Community**

This plant community develops after an extended period (10 to 20 years or more) of non-use and exclusion of fire. Eventually litter levels become high enough to reduce native grass vigor, diversity and density. Kentucky bluegrass and/or smooth brome grass dominates this plant community. Common forbs include American licorice, cudweed sagewort, and silverleaf scurfpea. Shrubs such as western snowberry and chokecherry will increase in density and cover.

This plant community is resistant to change without prescribed grazing and/or fire. The combination of both grazing and fire is most effective in moving this plant community toward the HCPC. Soil erosion is low. Runoff is similar to the HCPC. Once the advanced stage of this plant community is reached, time and external resources will be needed to see recovery in the diversity of the site.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: ND5406

Growth curve name: Missouri Slope, Introduced Cool-season Grasses.

Growth curve description: Introduced cool-season grasses.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	35	35	5	2	8	2	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Prescribed grazing or prescribed burning followed by prescribed grazing, will move this plant community toward the *Big Bluestem/Green Needlegrass Plant Community (HCPC)*. This would require long-term management with prescribed grazing and/or prescribed burning under controlled conditions.

### Blue Grama Sod Plant Community

This plant community developed with heavy continuous grazing without adequate recovery periods between grazing events. Blue grama dominates the community and can develop into a "sodbound" appearance. Low vigor western wheatgrass can be found scattered throughout the community. Green needlegrass has been removed. Big bluestem may persist in minor amounts, greatly reduced in vigor and not readily seen. Rose pussytoes, western yarrow, silverleaf scurfpea, curlycup gumweed and goldenrod have increased. Key shrubs have been severely reduced in vigor or removed completely.

This plant community is resistant to change due to grazing tolerance of blue grama. A significant amount of production and diversity has been lost when compared to the HCPC. Loss of cool season grasses, tall warm season grasses, shrub component and nitrogen fixing forbs have negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly due to the massive shallow root system (root pan), characteristic of "sodbound" blue grama. Soil loss may be accelerated where concentrated flows occur.

It will take a very long time to restore this plant community back to the HCPC with improved management. Renovation would be very costly.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: ND5410

Growth curve name: Missouri Slope, Lowland, Warm Season Dominant.

Growth curve description: Lowland, warm-season dominant, cool-season subdominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	3	22	30	30	8	5	2	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Long term prescribed grazing with adequate recovery periods following each grazing event and proper stocking over long periods of time can move this plant community toward the *Western Wheatgrass/Blue Grama Plant Community*. It may eventually return to the *HCPC* or associated successional plant community stages assuming an adequate seed/vegetative source is available. This process may take greater than 10 years.

### Annual/Pioneer Perennial Plant Community

This plant community develops under severe disturbance and/or excessive defoliation. This can result from heavy livestock or wildlife concentration, and cropping abandonment (go-back land). The dominant vegetation includes pioneer annual grasses, forbs, invaders, and early successional biennial and perennial species. Grasses may include red threeawn, sixweeks fescue, smooth brome, crested wheatgrass, annual brome, needleandthread, prairie junegrass, western wheatgrass and little bluestem. The dominant forbs include curlycup gumweed, maretail, salsify, kochia, field bindweed, thistles, western ragweed, pussytoes, prostrate verbena and other early successional species. Shrubs that may be present include prairie rose, fringed sagewort and broom snakeweed. Plant species from adjacent ecological sites may become minor components of this plant community. The community also is susceptible to invasion of other non-native species due to severe soil disturbances and relatively high percent of bare ground. Many annual and perennial forbs, including non-native species, have invaded the site.

This plant community is resistant to change, as long as soil disturbance or severe vegetation defoliation persists, thus holding back secondary plant succession. Soil erosion is potentially high. Reduced surface cover, low plant density, low plant vigor, loss of root biomass, and soil compaction, all contribute to decreased water infiltration, increased runoff, and accelerated erosion rates.

Significant economic inputs, management and time would be required to move this plant community toward a higher successional stage and a more productive plant community. Secondary succession is highly variable, depending upon availability and diversity of a viable seed bank of higher successional species within the existing plant community and neighboring plant communities. This plant community can be renovated to improve the production capability, but management changes would be needed to maintain the new plant community. The total annual production ranges from 500 to 1500 lbs./ac. (air-dry weight) depending upon growing conditions.

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Under long-term prescribed grazing and/or removal of disturbance, including adequate rest periods, this plant community will move through the successional stages, and may eventually lead to the *Big Bluestem/Green Needlegrass Plant Community (HCPC)*. Depending on the slope, aspect, and size, and if adequate perennial plants exist, this change can occur more rapidly. This process will likely take a long period of time (25+ years).
- Range seeding with deferment and prescribed grazing can convert this to a plant community resembling the *Big Bluestem/Green Needlegrass Plant Community*.

## **Ecological Site Interpretations**

### **Animal Community – Wildlife Interpretations**

-- Under Development --

**Big Bluestem/Green Needlegrass Plant Community:**

**Western Wheatgrass/Blue Grama Plant Community:**

**Blue Grama Sod Plant Community:**

**Kentucky Bluegrass, Excessive Litter, Increased Shrubs Plant Community:**

**Annual/Pioneer Perennial Plant Community:**

## Animal Preferences (Quarterly – 1,2,3,4<sup>†</sup>)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
<b>ses &amp; Grass-likes</b>							
bearded wheatgrass	U P U U	N D U N	U P U U	N D U N	N D U N	U P U U	U P U U
big bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
blue grama	U D P U	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
bluegrass	U D U U	D P U D	U D U U	U P N D	U P N D	U D U U	U D U U
Canada wildrye	U D U U	N U N N	U D U U	N U N N	N U N N	U D U U	U D U U
cheatgrass	U D U U	N P U N	U D U U	N P U N	N P U N	U D U U	U D U U
fescue sedge	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
green needlegrass	U P U D	N P N P	U P U D	N P N P	N P N P	U P U D	U P U D
Indiangrass	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
little bluestem	U D D U	N D N N	U D D U	N D N N	N D N N	U D D U	U D D U
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
Penn sedge	U P U D	U P N D	U P U D	U D U D	U D U D	U P U D	U P U D
porcupine grass	U P U D	N D N U	U P U D	N D N U	N D N U	U P U D	U P U D
prairie dropseed	N U P U	N U D U	N U P U	N U D U	N U D U	N U P U	N U P U
sideoats grama	U D P U	U P D U	U D P U	U P D U	U P D U	U D P U	U D P U
slender wheatgrass	U P U U	N D U N	U P U U	N D U N	N D U N	U P U U	U P U U
smooth brome	U P U U	U P U U	U P U U	U P U U	U P U U	U P U U	U P U U
switchgrass	U D D U	U D U U	U D D U	N N N N	N N N N	U D D U	U D D U
western wheatgrass	U P D U	N D N N	U P D U	N D N N	N D N N	U P D U	U P D U
<b>rbs</b>							
American licorice	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
American vetch	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
cudweed sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
Flodman's thistle	N U U N	N U U N	N U U N	N U U N	N U U N	N U U N	N U U N
goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	N U U N
heartleaf alexanders	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
heath aster	U U D U	U U P U	U U D U	U U P U	U U P U	U U D U	U U P U
Maximilian sunflower	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
meadow anemone	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U U U
northern bedstraw	N N N N	N U D N	N N N N	N U D N	N U D N	N N N N	N N N N
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
silverleaf scurfpea	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
western yarrow	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
<b>ubs</b>							
chokecherry	D T T D	D T T D	D T T D	P U D P	D U U D	D T T D	P U U P
golden currant	U D D U	U P P D	U D D U	U P P D	U U U U	U D D U	U P P D
hawthorn	N U U U	N D D U	N U U U	N D D U	N U D U	N U U U	N D D U
juneberry	N D P U	N D P U	N D P U	N D P U	N D P U	N D P U	N D P U
leadplant	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U	U P D U
poison ivy	N N N N	U U U U	N N N N	U U U U	U U U U	N N N N	U U U U
prairie rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
western snowberry	U U U U	U U U U	U U U U	D U D D	U U U U	U U U U	D U U U
wild plum	D U U D	D U U D	D U U D	P U D D	D U U D	D U U D	D U U D
<b>rees</b>							
American elm	N N N N	N N N N	N N N N	N U D N	N N N N	N N N N	N N N N
green ash	N U D U	N D D U	N U D U	N D D U	N U D U	N U D U	N D D U

**N** = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

<sup>†</sup> Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

## Animal Community – Grazing Interpretations

The following table lists suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions; however, *continuous grazing is not recommended*. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process and may need to be adjusted due to diet preferences of other types or kinds of livestock and/or other factors. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Production (lbs./acre)	Carrying Capacity <sup>1</sup> (AUM/acre)
Big Bluestem/Green Needlegrass	3200	1.00
Western Wheatgrass/Blue Grama	2200	0.69
Blue Grama Sod	1200	0.38
Kentucky Bluegrass, Excessive Litter, Increased Shrubs	2700	0.85 <sup>2</sup>
Annual/Pioneer Perennial	-- <sup>3</sup>	-- <sup>3</sup>

<sup>1</sup> Continuous season-long grazing by cattle under average growing conditions.

<sup>2</sup> Stocking rates may need to be adjusted due to palatability and/or availability of forage.

<sup>3</sup> Highly variable; stocking rate needs to be determined on site.

## Hydrology Functions

Water is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic groups B and C, with localized areas in hydrologic group D. Infiltration and runoff potential for this site varies from moderate to high depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where shortgrasses form a dense sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

## Recreational Uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

## Wood Products

No appreciable wood products are present on the site.

## Other Products

Seed harvest of native plant species can provide additional income on this site.

## Supporting Information

### Associated Sites

(054XY020ND) – Clayey

(054XY031ND) – Loamy

(054XY032ND) – Loamy Terrace

(054XY026ND) – Sandy

(054XY039ND) – Sandy Terrace

(054XY032ND) – Subirrigated

(054XY037ND) – Wet Meadow

## Similar Sites

### (054XY041ND) – Loamy Terrace (LyT)

[Well drained soils on a river or stream terrace in a position that will flood occasionally (once in ten years) with no apparent water table. Down slope from loamy, sandy, clayey, and sands, and upslope form subirrigated ecological sites. Indicator species are western wheatgrass evenly mixed with green needlegrass, American vetch, and western snowberry or silver sagebrush, and with possible trees. This site has far less big bluestem, more western wheatgrass and green needlegrass, less frequent flooding events, less production.]

### (054XY042ND) – Sandy Terrace (SyT)

[Well drained soils on a river or stream terrace in a position that will flood occasionally (once in ten years) with no apparent water table. Indicator species are prairie sandreed evenly mixed with sand bluestem, some Canada wildrye, penstemon, and leadplant and/or western snowberry, and with possible trees. This site has prairie sandreed and sand bluestem, far less big bluestem, less frequent flooding events, less production.]

### (054XY032ND) – Subirrigated (Sb)

[Some what poorly drained soils with no evidence of lime or salts. Water table found at a depth of 1.5 to 4' from the soil surface at some point during the growing season. Found upslope from wet meadow sites and downslope of overflow sites; can be in micro low or high positions within the listed associated sites. Indicator species are big bluestem intermixed with switchgrass and American licorice with shrubs like western snowberry. The site has more switchgrass, prairie cordgrass, less green needlegrass; higher production]

## Inventory Data References

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. Information presented here has been derived from NRCS clipping and other inventory data. All descriptions were peer reviewed and/or field tested by various private, State and Federal agency specialist.

Those involved in developing this site description include: Dennis Froemke, NRCS Range Management Specialist; Jeff Printz, NRCS State Range Management Specialist; L. Michael Stirling, NRCS Range Management Specialist; Stan Boltz, NRCS Range Management Specialist; Josh Saunders, NRCS Range Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; Jody Forman, NRCS Grazing Land Management Specialist; David Dewald, NRCS State Biologist; and Brad Podoll, NRCS Biologist.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	0			
Ocular estimates	8	1986 – 2001	ND	Dunn, Hettinger, Morton

## State Correlation

This site has been correlated with North Dakota and South Dakota in MLRA 54.

## Field Offices

Baker, MT	Buffalo, SD	Faith, SD	Mott, ND
Beach, ND	Carson, ND	Hettinger, ND	Selfridge, ND
Beulah, ND	Culbertson, MT	Killdeer, ND	Sidney, MT
Bison, SD	Dickinson, ND	Mandan, ND	Watford City, ND
Bowman, ND	Dupree, SD	McIntosh, SD	Wibaux, MT

## Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43a – Missouri Plateau.

## Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (<http://hpccsun.unl.edu>)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (<http://wcc.nrcs.usda.gov>)

USDA, NRCS. National Range and Pasture Handbook, September 1997

USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (<http://nasis.nrcs.usda.gov>)

USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, NRCS, Various Published Soil Surveys.

## Site Description Approval

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State Range Management Specialist

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Date

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State Range Management Specialist

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Date

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State Range Management Specialist

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Date